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Published in:
American Economic Review

The Labeling Effect of a Child Benefit System

By PETER KOOREMAN*

Child benefit systems exist in many countries. While they show a lot of differences in terms of eligibility rules, amounts involved, and implementation (tax deduction, tax credit, or direct benefit), the common motivation for their existence is to increase children's welfare. In the Dutch child benefit system—the case I focus on in this paper—one of the parents, usually the mother, is entitled to an untaxed child benefit amount which only depends on the child's age and the number of children in the household. Thus, child support does not depend on household income, marital status, or labor-market status. As a result, child benefit is exogenous to the household given the presence of children. This is in contrast with the situation in many other countries, including Germany, France, the United Kingdom, and the United States, where government-provided child support is (partly) means-tested; see Jonathan Bradshaw et al. (1993). In The Netherlands, child benefit is generally a nonnegligible addition to the household income; the median share of child benefit in the total net income of households with children is 8 percent. On the national level, expenditures on child benefits amount to 1.2 percent of GNP. The use of the child benefit is completely at the discretion of the parent. There are no legal requirements that a certain amount be spent on particular goods or services, nor does the government provide any guidelines regarding expenditure on children.

A policy question that arises is to what extent children benefit from child benefits. Standard microeconomic demand theory allows no role for effects of the composition of income. Given the fungibility of income sources, it is only the sum of income components that is relevant in explaining expenditure patterns. Thus, within that framework, the answer would be that the marginal propensity to consume child goods from one guilder of child benefits is no different than from one guilder of any other income source. In the more general class of game-theoretic models of household behavior, however, the composition of household income will generally affect expenditure patterns; see, e.g., Shelly J. Lundberg and Robert A. Pollak (1993) and Martin Browning et al. (1994). If fathers and mothers have different preferences, and mothers have control over child benefits, the effect of child benefits on expenditures will differ from the effect of other income sources. Lundberg et al. (1997) provide empirical evidence showing that a transfer of control over child benefits from fathers to mothers in the United Kingdom due to a change in legislation resulted in a significant increase in expenditures on child clothing. Daniela Del Boca and Christopher J. Flinn (1994) have analyzed the effect of income composition on expenditure decisions of divorced mothers. They find that the coefficients associated with child support and alimony income differ from those for other income in Engel curves for expenditures on child-specific goods. Their results can be explained in terms of a noncooperative Nash model in which the child support transfer decisions of the noncustodial father and the expenditure decisions of the mother are determined simultaneously. In contrast to Del Boca and Flinn's analysis, in which child support is a decision variable, the present paper focuses on the possible differential effect of government-provided child support which is truly exogenous.

In this paper I analyze the effects of child benefits on expenditures by running regressions in which child benefit enters as a separate explanatory variable. The empirical analysis is based on a time series of 17 cross-section consumer expenditure surveys in The Netherlands, covering the period 1978 through 1994. It is important to note that in a single cross-section it

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would be impossible to separate in a nonparametric sense the effect of child benefits on expenditures from the direct effect of children. To illustrate the point, consider a group of households which are homogeneous with respect to family composition. Since child benefit entitlement only depends on the number of children in particular age-groups, child benefits would not vary across these households in a cross-section. However, in the time series of cross-sections there is "quasi-natural experiment" variation in child benefit amounts due to various policy changes.

The paper proceeds as follows. Section I describes the sample and the Dutch child benefit system. Section II contains the results of estimation, and of testing the null hypothesis of equal effects of different income sources on expenditures. In Section III, I search for possible misspecifications in the regressions. Section IV concludes.

I. The Data and the Dutch Child Benefit System

The empirical analysis is based on the annual *Consumer Expenditure Surveys* of the Dutch Central Bureau of Statistics (Statistics Netherlands). The data set comprises 17 cross-sections covering the period 1978 through 1994, and contains information on 41,053 different households. Only households in which all children are aged between 0 and 11 are used. I do not use data on households with older children, since a preliminary data analysis suggests that clothing for these children is largely counted as adult clothing.[1] Some sample statistics are given in Tables 1, 2, and 3.

In the Dutch child benefit system a parent raising a child is entitled to an untaxed child benefit amount. In two-parent households the child benefit is usually paid to the mother.[2] The entitlement is determined on a quarterly basis. The amount in quarter t depends on the number and ages of children present in the household on the last day of quarter $t - 1$. The benefits are then credited to the recipient's bank account on the first day of quarter $t + 1$.

Between 1978 and 1994, the period considered here, there have been various changes in the system (in addition to the one referred to in footnote 2). The most important change was implemented on January 1, 1983, when benefits were made dependent on the age of the child; see Table 4. As of that date the amount for a child in the age-group 0–5 equals approximately 70 percent of the amount for a child between 6 and 11.[3] In the years 1988 through 1993, there were some increases in the amounts for the first child. Despite the overwhelming empirical evidence that the costs of children exhibit economies of scale, the child benefit amounts have been progressive in the number of children (until January 1, 1995).

II. Empirical Results

I estimate a number of equations explaining household expenditures on child clothing and adult clothing (including footwear). I focus on clothing as this is generally considered to be an "assignable" good with a low degree of publicness; cf., Browning et al. (1994). The analysis is of a reduced-form type, given the focus on how expenditures are affected by income variables which are usually not included separately in demand equations.

In order to reduce heterogeneity and avoid misspecification with respect to family composition effects, I estimate separate equations for each family size. The vector of explanatory variables includes a constant term, child benefit, net household income minus child benefit, the sex of the parent (for single-parent households), the fraction of children aged between 6 and 11, the fraction of girls,

[1] For the sample of one-parent households with one child over 11 and no other children, for example, I find a negative effect of the child's age on child clothing expenditures and a strong positive effect on adult clothing expenditures.

[2] Before January 1, 1982, child benefits were paid to the head of the household.

[3] However, for parents who already received child benefits before 1983, the amounts were lowered gradually by approximately 5 percent each year; the 70-percent amount only applied to "new" parents. As a consequence, there is (limited) cross-section variation in the child benefit amounts for the 0–5 age-group in the years 1983–1987.

TABLE 1—SAMPLE STATISTICS; TWO-PARENT HOUSEHOLDS, ONE CHILD AGED 0–11

Variable	Mean	Standard deviation	Minimum	Maximum
Mother				
Age	29.8	5.45	17	53
Education index	3.21	1.27	1	7
Paid job	0.294			
Father				
Age	32.2	5.84	20	70
Education index	3.47	1.40	1	7
Paid job	0.935			
Child				
Aged 6–11	0.185			
Sex (1 if female, 0 if male)	0.485			
Income and expenditures (nominal, in Dutch guilders)				
Child benefit	1,056	465	0[a]	7,136
Net income minus child benefit	40,816	16,685	698	169,500
Child clothing expenditures	690	817	0[b]	7,331
Adult clothing expenditures	1,658	1,402	0[c]	16,130
General consumer price index (1975 = 100)	160.4	19.38	120.9	195.4
Year is 1978	0.055			
Year is 1979	0.046			
Year is 1980	0.080			
Year is 1981	0.060			
Year is 1982	0.075			
Year is 1983	0.066			
Year is 1984	0.079			
Year is 1985	0.098			
Year is 1986	0.060			
Year is 1987	0.051			
Year is 1988	0.043			
Year is 1989	0.038			
Year is 1990	0.092			
Year is 1991	0.024			
Year is 1992	0.046			
Year is 1993	0.048			
Year is 1994	0.041			

[a] Zero for 81 observations.
[b] Zero for 302 observations.
[c] Zero for 53 observations.

and year dummies (with 1982 as the reference year). Note that this specification precludes the inclusion of a price variable as a regressor. All amounts are expressed in real terms using the general consumer price index.

Note that in the absence of cross-section variation in the child benefit amounts within a given age-group, the child benefit coefficient would not be identified if interaction terms of the child-age dummy and the time dummies would be included. So, the implicit identifying assumption is that there are no such interaction effects other than those caused by the child benefit.

In Table 5 I present ordinary least-squares (OLS) estimation results for households with one child. The marginal propensities to consume (MPCs) in Table 5 show a remarkable pattern. Consider first the results for two-parent families. In the child clothing equation both child benefit and other income sources are highly significant, but the MPC out of child benefit is more than ten times as large as the MPC out of other income sources. In the

TABLE 2—SAMPLE STATISTICS; SINGLE PARENTS, ONE CHILD AGED 0–11

Variable	Mean	Standard deviation	Minimum	Maximum
Parent				
Age	33.0	6.32	19	54
Education index	3.05	1.35	1	7
Sex (1 if female, 0 if male)	0.961			
Divorced	0.541			
Widowed	0.410			
Paid job	0.249			
Child				
Aged 6–11	0.502			
Sex (1 if female, 0 if male)	0.507			
Income and expenditures (nominal, in Dutch guilders)				
Child benefit	1,110	444	0[a]	2,858
Net income minus child benefit	25,381	10,980	11,954	92,569
Child clothing expenditures	563	790	0[b]	6,409
Adult clothing expenditures	900	955	0[c]	5,973
Prices (1975 = 100)				
Clothing price index	145.6	11.14	121.1	162.8
General consumer price index	162.3	21.36	120.9	195.4
Year is 1978	0.052			
Year is 1979	0.057			
Year is 1980	0.048			
Year is 1981	0.096			
Year is 1982	0.061			
Year is 1983	0.066			
Year is 1984	0.061			
Year is 1985	0.031			
Year is 1986	0.035			
Year is 1987	0.022			
Year is 1988	0.035			
Year is 1989	0.083			
Year is 1990	0.070			
Year is 1991	0.044			
Year is 1992	0.070			
Year is 1993	0.079			
Year is 1994	0.092			

[a] Zero for 17 observations.
[b] Zero for 32 observations.
[c] Zero for 15 observations.

adult clothing equation, however, "other income sources" is highly significant, whereas the child benefit coefficient is not significantly different from zero. At the 1-percent significance level, the difference between MPCs is significant for child clothing, but not for adult clothing.[4] The size and significance of the coefficient for "child is girl" imply that two-parent households with a girl spend 14 percent more on child clothing than two-parent households with a boy.

For single-parent households the difference between MPCs in the child clothing equation is larger than for two-parent households (0.200

[4] Adding up restrictions require that differences between MPCs in the child clothing equation are reflected by opposite differences in expenditure equations for other goods. Of course, this mirror effect is not necessarily restricted to the adult clothing equation.

TABLE 3—SAMPLE STATISTICS; WIDOWED SINGLE PARENTS, ONE CHILD AGED 0–11

Variable	Mean	Standard deviation	Minimum	Maximum
Parent				
Age	31.6	6.24	19	52
Education index	3.30	1.33	1	6
Sex (1 if female, 0 if male)	0.945			
Paid job	0.309			
Child				
Aged 6–11	0.638			
Sex (1 if female, 0 if male)	0.511			
Income and expenditures (nominal, in Dutch guilders)				
Child benefit	1,161	393	0[a]	2,330
Net income minus child benefit	25,111	7,955	13,080	55,478
Child clothing expenditures	497	694	0[b]	4,410
Adult clothing expenditures	758	807	0[c]	4,507
Prices (1975 = 100)				
Clothing price index	142.4	12.40	121.1	162.8
General consumer price index	154.3	22.00	120.9	195.4
Year is 1978	0.021			
Year is 1979	0.032			
Year is 1980	0.032			
Year is 1981	0.074			
Year is 1982	0.032			
Year is 1983	0.043			
Year is 1984	0.106			
Year is 1985	0.053			
Year is 1986	0.032			
Year is 1987	0.032			
Year is 1988	0.021			
Year is 1989	0.085			
Year is 1990	0.074			
Year is 1991	0.053			
Year is 1992	0.085			
Year is 1993	0.085			
Year is 1994	0.138			

[a] Zero for 3 observations.
[b] Zero for 2 observations.
[c] Zero for 8 observations.

versus 0.103), but it is not significantly different from zero. Note that the number of observations is only 229, as compared with 3,135 observations on two-parent households. One of the few significant coefficients is "female parent" in the adult clothing equation; single mothers spend approximately 75 percent more on adult clothing than do single fathers. While Lundberg et al. (1997) concluded that in two-parent families mothers attach more weight to child clothing than do fathers, there is no such evidence in the present sample of single fathers and single mothers, given the insignificance of the female-parent dummy in the child clothing equation.

Table 5 also reports the expenditure equations estimated on the subsample of *widowed* single parents with one child aged between 0 and 11. In spite of the small number of observations (94), the difference between MPCs in the child clothing equation is significant at the 10-percent level. Moreover, it is much larger than the corresponding difference for two-parent households; when widowed single parents receive an additional child benefit guilder, they spend 50 cents on child clothing, whereas an additional guilder from other income sources is not used for child clothing. The coefficient of "female parent" is significant. It should be

TABLE 4—CHILD BENEFIT AMOUNTS (QUARTERLY, NOMINAL, IN DUTCH GUILDERS)

	Children aged 0–5		Children aged 6–11	
	1 child	2 children	1 child	2 children
1978	238	610	238	610
1979	245	633	245	633
1980	259	679	259	679
1981	274	710	274	710
1982	284	745	284	745
1983	203	533	293	769
1984	203	533	290	762
1985	205	537	292	767
1986	205	538	293	768
1987	203	532	290	760
1988	213	558	304	797
1989	242	563	306	804
1990	234	590	334	843
1991	252	619	360	884
1992	269	645	384	921
1993	279	658	399	941
1994	279	658	399	941

Sources: Th. Nieuwenhuysen (1990) and various publications from the Ministry of Social Affairs and Employment. See also footnote 3.

noted, however, that there are only five fathers in this subsample.

For households with one child, I also estimated an alternative (nested) specification with a price variable and a time trend, and no year dummies. For two-parent households, F-tests indicate unambiguous rejection against the more general specification with year dummies. However, this is not the case for single-parent households. Table 6 reports the test results, as well as the estimation results for the alternative specification. The differences between MPCs in the child clothing equations are now significant at the 5-percent level. Moreover, they are larger than the corresponding differences in Table 5; for widowed single parents it is as large as 0.692. For households with more than one child the differences between MPCs are not significant; see Table 7. This result might be related to the fact that child benefit increases more than proportionally in the number of children. In combination with the economies of scale in the costs of child clothing, we can therefore expect a lower marginal propensity to consume child clothing out of child benefits in larger households, and thus a smaller difference between MPCs.

III. Robustness Checks

This section investigates whether the pattern of MPCs can be attributed to misspecifications of the econometric model. I subsequently analyze the possible roles of measurement errors, functional form specification, omitted variables, and endogeneity of explanatory variables, for the two-parent estimation results in Table 5.

A. *Measurement Errors*

Measurement errors in the dependent variable increase the estimated standard errors and may bias the constant term. However, the slope coefficients are not affected (given that some mild assumptions on the errors are satisfied). Therefore, I focus on the possible biasing effects of measurement errors in the explanatory variables. In particular the two income variables are likely to be measured with error.

The information on income in the data set was collected by means of a detailed questionnaire on a large number of income components. To check for errors in the child benefit amounts, I constructed an alternative child benefit variable on the basis of direct information on Child Benefit Act regulations from the Ministry of Social Affairs and Employment; cf., Table 4. The means of the two variables are virtually identical, but the standard deviation of the second measure is only one-third of the standard deviation of the first measure. Estimating the child clothing equation by instrumental variables using the second measure as an instrument yields a child benefit coefficient of 0.423 (t-value 2.0) and a coefficient of 0.010 (t-value 10.9) for other income sources. In the adult clothing equation, these coefficients are 0.347 (t-value 1.0) and 0.039 (t-value 25.7), respectively. At the 5-percent significance level, the difference between MPCs is significant for child clothing, but not for adult clothing. So, the results seem to reinforce the previous findings.

For the variable "other income sources" an alternative data source is not available. Suppose without loss of generality that "other income sources" is the first of K regressors. Let x_1 and

TABLE 5—ESTIMATION RESULTS; HOUSEHOLDS WITH ONE CHILD AGED 0–11
(*t*-VALUES IN PARENTHESES)

	Two-parent households (3,135 observations)		Single-parent households (229 observations)		Widowed single parents (94 observations)	
	Child clothing	Adult clothing	Child clothing	Adult clothing	Child clothing	Adult clothing
Explanatory variables						
Constant	0.529	1.85	−0.729	−23.8	5.32	−15.29
	(1.1)	(2.3)	(−0.1)	(−2.9)	(2.2)	(−1.4)
Child benefit	**0.113**	**−0.019**	**0.206**	**−0.079**	**0.503**	**−0.062**
	(3.9)	**(−0.4)**	**(1.2)**	**(−0.4)**	**(1.8)**	**(−0.2)**
Other income sources	**0.010**	**0.039**	**0.006**	**0.044**	**0.000**	**0.034**
	(10.8)	**(25.7)**	**(1.2)**	**(8.2)**	**(0.0)**	**(4.2)**
Female parent	—	—	0.606	5.37	5.32	4.08
			(0.3)	(2.8)	(2.4)	(1.7)
Child aged 6–11	0.364	0.841	0.563	0.158	−0.942	−1.667
	(1.6)	(2.3)	(0.7)	(0.2)	(−0.8)	(−1.2)
Child is girl	0.510	0.166	−0.665	1.26	0.783	0.953
	(3.0)	(0.6)	(−0.9)	(1.7)	(0.8)	(0.9)
Year is 1978	0.914	3.17	0.879	4.21	4.804	6.152
	(1.9)	(4.0)	(0.4)	(1.9)	(1.2)	(1.4)
Year is 1979	1.20	1.38	0.578	1.28	4.819	−0.326
	(2.4)	(1.6)	(0.3)	(0.6)	(1.4)	(−0.1)
Year is 1980	0.813	0.647	0.473	1.17	3.923	−2.359
	(1.9)	(0.9)	(0.2)	(0.5)	(1.1)	(−0.6)
Year is 1981	0.754	−0.047	0.242	0.079	4.323	0.243
	(1.6)	(−0.1)	(1.3)	(0.0)	(1.5)	(0.1)
Year is 1983	0.470	−1.26	−0.528	−1.18	0.930	−2.290
	(1.0)	(−1.7)	(−0.3)	(−0.6)	(0.3)	(−0.6)
Year is 1984	−0.537	−2.30	−0.243	−1.65	0.722	−3.558
	(−1.2)	(−3.2)	(−0.1)	(−0.8)	(0.3)	(−1.2)
Year is 1985	−0.507	−2.64	−1.38	−3.61	−0.877	−4.066
	(−1.2)	(−3.9)	(−0.6)	(−1.4)	(−0.3)	(−1.2)
Year is 1986	−0.956	−2.40	4.66	2.19	3.472	−4.912
	(−2.0)	(−3.1)	(2.0)	(0.9)	(1.0)	(−1.3)
Year is 1987	−0.369	−0.609	1.89	1.85	2.923	−1.283
	(−0.8)	(−0.8)	(0.7)	(0.7)	(0.8)	(−0.3)
Year is 1988	−1.50	−1.15	−1.91	−2.33	−1.552	−0.643
	(−2.9)	(−1.3)	(−0.8)	(−1.0)	(−0.4)	(−0.2)
Year is 1989	−2.63	−3.77	−1.91	−1.24	−1.117	−1.003
	(−4.9)	(−4.3)	(−1.0)	(−0.7)	(−0.4)	(−0.3)
Year is 1990	−1.66	−4.11	−2.20	1.03	−0.889	1.237
	(−4.0)	(−5.9)	(−1.1)	(0.5)	(−0.3)	(0.4)
Year is 1991	−2.51	−3.31	2.29	0.247	−0.598	−3.025
	(−2.4)	(−3.2)	(1.0)	(0.1)	(−0.2)	(−0.8)
Year is 1992	−0.312	−3.92	2.42	−1.17	0.822	−2.600
	(−0.6)	(−4.7)	(1.1)	(−0.5)	(0.3)	(−0.7)
Year is 1993	0.413	−2.70	0.926	−0.835	5.908	−2.410
	(0.8)	(−3.3)	(0.4)	(−0.4)	(0.3)	(−0.6)
Year is 1994	0.129	−3.08	−0.845	−4.46	0.910	3.718
	(0.2)	(−3.6)	(−0.4)	(−1.9)	(0.3)	(−1.0)
Difference between coefficients of "child benefit" and "other income sources"	0.103	−0.058	0.200	−0.123	0.502	−0.095
	(3.6)	(−1.2)	(1.2)	(−0.7)	(1.8)	(−0.3)
p-value	0.000	0.225	0.248	0.490	0.083	0.760

TABLE 6—ESTIMATION RESULTS; SINGLE PARENTS WITH ONE CHILD AGED 0–11; SPECIFICATION WITH TIME TREND (t-VALUES IN PARENTHESES)

	Single parents (229 observations)		Widowed single parents (94 observations)	
	Child clothing	Adult clothing	Child clothing	Adult clothing
Explanatory variables				
Constant	15.04	−6.40	−4.01	−22.06
	(1.1)	(−0.5)	(−0.2)	(−1.1)
Child benefit	**0.330**	**−0.202**	**0.689**	**−0.317**
	(2.2)	**(−1.3)**	**(2.6)**	**(−1.7)**
Other income sources	**0.008**	**0.043**	**−0.003**	**0.038**
	(1.5)	**(8.2)**	**(−0.3)**	**(4.0)**
Price variable	7.09	−2.34	−18.03	−23.61
	(0.8)	(−0.3)	(−1.6)	(−2.0)
Female parent	−0.334	4.46	2.90	4.51
	(−0.2)	(2.4)	(1.3)	(2.0)
Child aged 6–11	−0.630	−0.669	1.40	0.303
	(−0.8)	(−0.8)	(1.2)	(0.2)
Child is girl	−0.717	0.738	−0.163	0.453
	(−1.0)	(1.0)	(−0.2)	(0.5)
Time trend	−0.218	−0.114	0.081	0.302
	(−1.1)	(−0.6)	(0.3)	(1.1)
Difference between coefficients of "child benefit" and "other income sources"	0.322	−0.244	0.692	−0.355
	(2.1)	(−1.6)	(2.6)	(−1.3)
p-value	0.033	0.191	0.009	0.191
Test against specification with year dummies				
$F_{(14,207)}$, $F_{(14,72)}$-test statistic	1.433	1.473	1.713	0.917
p-value	0.140	0.123	0.072	0.545

x_1^* denote the observed and true values, respectively. Assume that $x_1 = x_1^* + \eta$. The measurement error η is independent of x_1^*, and $\text{var}(\eta) = \sigma^2$. The (asymptotic) bias of the coefficients can then be expressed as

$$(1) \quad plim\hat{\boldsymbol{\beta}}_{OLS} - \boldsymbol{\beta} = -\sigma^2\beta_1 \cdot plim\left(\frac{\boldsymbol{X}'\boldsymbol{X}}{N}\right)^{-1} \cdot \boldsymbol{e_1}.$$

Here $\boldsymbol{\beta}$ is the true parameter vector, β_1 is its first element, N is the number of observations, $\boldsymbol{X}$ is the $(N \times K)$-matrix of explanatory variables, and $\boldsymbol{e_1}$ is a K-vector with first element equal to one and the other elements equal to zero; cf., Maurice D. Levi (1973). The results of Bernard van Praag et al. (1983) indicate that for this type of income data measurement errors typically account for approximately 20 percent of the sample variance. Using equation (1) the parameter values that would correspond to $\sigma^2 = 0.2*\text{var}(x_1)$ can be calculated. These calculations reveal that the measurement error induces a downward bias in the coefficient of "other income sources" whereas the effect on other coefficients is negligible. For child clothing the MPC out of child benefit is still more than ten times as large as the MPC out of other income sources. I conclude that accounting for measurement errors does not alter the earlier findings.

B. *Functional Form*

Since there is a nonzero proportion of zeros in the dependent variables (1.7 percent for adult

TABLE 7—SUMMARY OF DIFFERENCES BETWEEN MPCs[a]
(*t*-VALUES IN PARENTHESES)

	Two-parent households		Single-parent households	
	Child clothing	Adult clothing	Child clothing	Adult clothing
1 child				
Number of observations	3,135		229	
Difference between coefficients of "child benefit" and "other income sources"	0.103 (3.6)	−0.058 (−1.2)	0.200 (1.2)	−0.123 (−0.7)
2 children				
Number of observations	5,601		147	
Difference between coefficients of "child benefit" and "other income sources"	0.028 (1.1)	−0.028 (−0.9)	−0.158 (−1.2)	−0.052 (−0.5)
3 children				
Number of observations	1,522		21[b]	
Difference between coefficients of "child benefit" and "other income sources"	0.047 (1.0)	−0.038 (−0.8)	—	—
4 children				
Number of observations	245		—	
Difference between coefficients of "child benefit" and "other income sources"	−0.022 (−0.2)	−0.121 (−1.7)	—	—

[a] Specification with year dummies.
[b] Number of observations is smaller than the number of regressors.

clothing and 9.6 percent for child clothing), I have also estimated Tobit models; see Table 8. The difference between the coefficients of "child benefit" and "other income sources" in the child clothing Tobit equation is 0.111 with a *t*-value of 3.6; the difference between the MPCs in the adult clothing Tobit equation is not significant. So, using Tobit rather than OLS does not change the results.

The estimation results might be biased due to the imposition of linearity. To allow for more parametric flexibility I reestimated the expenditure equations using a quadratic specification in child benefit (CB) and other income sources (Y). Let β_1, β_2, β_{11}, β_{12}, and β_{22} denote the coefficients of Y, CB, Y^2, $Y \cdot CB$, and CB^2, respectively. If expenditures depend on $(Y + CB)$ and $(Y + CB)^2$, then the restrictions $\beta_1 = \beta_2$ and $\beta_{11} = \beta_{22} = \frac{1}{2}\beta_{12}$ should hold. The *p*-values on the basis of *F*-tests are 0.003 for child clothing and 0.431 for adult clothing; see Table 9. So, the earlier results are reconfirmed.

C. *Omission of Leisure*

Another potential source of misspecification is the omission of leisure in the expenditure equation. To test and correct for this, I follow a procedure suggested by Browning and Costas Meghir (1991). The idea is to include an indicator of leisure as an explanatory variable in the expenditure equations and test whether it is significant. This is tantamount to testing whether leisure is weakly separable from clothing in the parents' utility function. As hours of work is not available in the data set, I use a dummy for the mother's labor-market participation (the participation rate of fathers is 93.5 percent). Since participation is potentially endogenous, it is instrumented using dummies for the mother's education level. The participation variable has a negative and significant effect in the child clothing equation, which may be a reflection of the time costs associated with the purchase of child clothing. The participation variable is insignificant in the equation for adult clothing. More importantly, the marginal propensities to consume remain virtually unchanged in both equations; see Table 10.

D. *Endogeneity of Explanatory Variables*

The estimation results might be biased due to endogeneity of some of the explanatory variables. Recall that child benefits do not depend on household income, marital status, or

TABLE 8—ESTIMATION RESULTS; TOBIT MODEL
(*t*-VALUES IN PARENTHESES)

	Child clothing	Adult clothing
Explanatory variables		
Constant	0.050	1.85
	(0.1)	(2.3)
Child benefit	**0.122**	**−0.019**
	(4.0)	**(−0.4)**
Other income sources	**0.011**	**0.039**
	(11.1)	**(25.7)**
Child aged 6–11	0.427	0.841
	(1.8)	(2.3)
Child is girl	0.524	0.166
	(2.8)	(0.6)
Year is 1978	0.979	3.17
	(1.9)	(4.0)
Year is 1979	1.29	1.38
	(2.4)	(1.6)
Year is 1980	0.807	0.647
	(1.7)	(0.9)
Year is 1981	0.761	−0.047
	(1.5)	(−0.1)
Year is 1983	0.560	−1.26
	(1.1)	(−1.7)
Year is 1984	−0.587	−2.30
	(−1.3)	(−3.2)
Year is 1985	−0.676	−2.64
	(−1.5)	(−3.9)
Year is 1986	−1.277	−2.40
	(−2.5)	(−3.1)
Year is 1987	−0.585	−0.609
	(−1.1)	(−0.8)
Year is 1988	−1.914	−1.15
	(−3.4)	(−1.3)
Year is 1989	−3.596	−3.77
	(−6.1)	(−4.3)
Year is 1990	−2.560	−4.11
	(−5.6)	(−5.9)
Year is 1991	−1.892	−3.31
	(−2.8)	(−3.2)
Year is 1992	−0.540	−3.92
	(−1.0)	(−4.7)
Year is 1993	0.270	−2.70
	(0.5)	(−3.3)
Year is 1994	0.122	−3.08
	(4.0)	(−3.6)
Difference between coefficients of "child benefit" and "other income sources"	0.111	−0.060
	(3.6)	(−1.3)
p-value	0.000	0.208

TABLE 9—ESTIMATION RESULTS; QUADRATIC SPECIFICATION IN INCOME VARIABLES
(*t*-VALUES IN PARENTHESES)

	Child clothing	Adult clothing
Explanatory variables		
Constant	0.187	0.199
	(0.2)	(0.2)
Y	0.011	0.497
	(3.0)	(8.6)
CB	0.194	0.472
	(2.1)	(0.3)
Y^2	0.000001	−0.000013
	(0.3)	(−1.7)
CB^2	−0.0015	0.0008
	(−0.6)	(0.2)
$Y \cdot CB$	−0.0002	−0.00033
	(−0.7)	(−0.7)
Child aged 6–11	0.352	0.865
	(1.5)	(2.3)
Child is girl	0.511	0.180
	(3.0)	(0.6)
Year is 1978	0.905	3.085
	(1.9)	(4.0)
Year is 1979	1.180	1.281
	(2.3)	(1.5)
Year is 1980	0.789	0.563
	(1.8)	(0.8)
Year is 1981	0.743	−0.127
	(1.6)	(−0.2)
Year is 1983	0.467	−1.292
	(1.0)	(−1.7)
Year is 1984	−0.549	−2.379
	(−1.3)	(−3.3)
Year is 1985	−0.517	−2.665
	(−1.2)	(−3.9)
Year is 1986	−0.981	−2.524
	(−2.1)	(−3.3)
Year is 1987	−0.401	−0.712
	(−0.8)	(−0.9)
Year is 1988	−1.523	−1.266
	(−2.9)	(−1.5)
Year is 1989	−2.646	−3.872
	(−4.9)	(−4.4)
Year is 1990	−1.688	−4.204
	(−4.0)	(−6.0)
Year is 1991	−1.543	−3.381
	(−2.4)	(−3.2)
Year is 1992	−0.336	−4.002
	(−0.7)	(−4.8)
Year is 1993	0.374	−2.755
	(0.7)	(−3.3)
Year is 1994	0.095	−3.182
	(0.2)	(−3.7)
$F_{(3,3111)}$-test statistic	4.553	0.643
p-value	0.003	0.431

labor-market status, so that they are exogenous to the household given the presence of a child. Thus the only variable where endogeneity is a potential problem is "other income sources." For example, a strong preference for clothing may induce higher labor earnings, in which case income would not be independent of the error term in the clothing expenditure equations. Us-

TABLE 10—ESTIMATION RESULTS; (INSTRUMENTED) PARTICIPATION VARIABLE INCLUDED (*t*-VALUES IN PARENTHESES)

	Child clothing	Adult clothing
Explanatory variables		
Constant	0.864	2.319
	(1.6)	(2.6)
Child benefit	**0.107**	**−0.030**
	(3.6)	**(−0.6)**
Other income sources	**0.011**	**0.039**
	(10.2)	**(22.5)**
Child aged 6–11	0.381	2.976
	(1.6)	(3.6)
Child is girl	0.591	0.170
	(3.3)	(0.6)
Mother has paid job	−1.914	−0.188
	(−2.5)	(−0.1)
Year is 1978	0.756	2.976
	(1.5)	(3.6)
Year is 1979	1.097	1.187
	(2.1)	(1.4)
Year is 1980	0.602	0.471
	(1.3)	(0.6)
Year is 1981	0.718	−0.282
	(1.5)	(−0.3)
Year is 1983	0.392	−1.499
	(0.8)	(−1.9)
Year is 1984	−0.556	−2.464
	(−1.2)	(−3.2)
Year is 1985	−0.345	−2.891
	(−0.8)	(−3.9)
Year is 1986	−0.789	−2.390
	(−1.6)	(−2.9)
Year is 1987	−0.112	−0.716
	(−0.2)	(−0.8)
Year is 1988	−1.254	−1.204
	(−2.2)	(−1.3)
Year is 1989	−2.627	−3.803
	(−4.5)	(−4.0)
Year is 1990	−1.555	−4.360
	(−3.5)	(−6.0)
Year is 1991	−1.441	−3.557
	(−2.2)	(−3.2)
Year is 1992	−0.096	−4.113
	(−0.2)	(−4.6)
Year is 1993	0.781	−2.866
	(1.4)	(−3.2)
Year is 1994	0.500	−3.128
	(0.9)	(−3.3)
Difference between coefficients of "child benefit" and "other income sources"	0.097	−0.068
	(3.2)	(−1.4)
p-value	0.001	0.168

ing the Alberto Holly and Dennis Sargan (1982) extension of a test procedure developed by Jerry A. Hausman (1978), I tested and corrected for exogeneity in the following way. First, I regressed income on a number of instruments (education dummies and age of both parents, as well as the exogenous explanatory variables) and computed the residuals. Next, the clothing equations were estimated with the residual from the first-stage regression as an additional explanatory variable. Testing for the significance of the coefficient of the residual is equivalent to an exogeneity test for "other income sources." The *t*-values on the residual variable are 1.9 and −0.6 for child clothing and adult clothing, respectively. The two-stage least-squares estimates are virtually identical to the OLS estimates; see Table 11.

I conclude that the main result is robust against the specification checks.[5]

IV. Conclusion

In this paper I have presented empirical evidence indicating that for some groups of households the marginal propensity to consume child clothing out of exogenous child benefits is much larger than the marginal propensity to consume child clothing out of other income sources. For adult clothing such an effect is not present. These results were found for households with one child; in larger households the differences between MPCs were not significant.

One possible explanation for the results in two-parent households is related to the fact that mothers have primary control over child benefits. This might result in a pattern of MPCs as found here, if mothers have stronger preferences for child clothing than fathers. However, this argument is irrelevant in single-parent families. The empirical results for single parents therefore suggest another explanation. It is conceivable that parents consider the child benefit as a benchmark for what they should spend on their children, or that they experience a moral obligation to spend a relatively large part of child benefits on child goods. In such a case child benefits change parents' preferences

[5] Many of the single-parent households in the sample have low incomes and are likely to be liquidity constrained. In such a case durable goods (as is clothing to some extent) are purchased as soon as a relatively large amount of money (such as child benefits) arrives. However, this argument cannot explain why the results for child clothing and for adult clothing are different.

TABLE 11—TWO-STAGE LEAST-SQUARES ESTIMATION RESULTS (*t*-VALUES IN PARENTHESES)

	Child clothing	Adult clothing
Explanatory variables		
Constant	1.378	1.884
	(2.1)	(1.7)
Child benefit	**0.108**	**−0.030**
	(3.6)	**(−0.6)**
Other income sources	**0.007**	**0.040**
	(3.4)	**(12.7)**
Child aged 6–11	0.521	0.758
	(2.2)	(1.9)
Child is girl	0.600	0.167
	(3.4)	(0.6)
Year is 1978	0.743	3.011
	(1.5)	(3.7)
Year is 1979	1.116	1.201
	(2.1)	(1.4)
Year is 1980	0.653	0.470
	(1.5)	(0.6)
Year is 1981	0.682	−0.255
	(1.4)	(−0.3)
Year is 1983	0.357	−1.464
	(0.7)	(−1.8)
Year is 1984	−0.588	−2.464
	(−1.3)	(−3.2)
Year is 1985	−0.625	−2.887
	(−1.4)	(−4.0)
Year is 1986	−0.913	−2.496
	(−1.8)	(−3.0)
Year is 1987	−0.228	−0.841
	(−0.4)	(−1.0)
Year is 1988	−1.406	−1.316
	(−2.5)	(−1.4)
Year is 1989	−2.755	−3.898
	(−4.8)	(−4.1)
Year is 1990	−1.744	−4.390
	(−4.0)	(−6.1)
Year is 1991	−1.595	−3.611
	(−2.4)	(−3.3)
Year is 1992	−0.199	−4.244
	(−0.4)	(−4.7)
Year is 1993	0.695	−2.985
	(1.3)	(−3.3)
Year is 1994	0.397	−3.246
	(0.7)	(−3.5)
Residual from first-stage regression	0.004	−0.002
	(1.9)	(−0.6)
Difference between coefficients of "child benefit" and "other income sources"	0.101	−0.071
	(3.4)	(−1.4)
p-value	0.001	0.156

towards child goods: The labeling effect of a child benefit system.

A number of issues would seem interesting for future research. First, the analysis could be extended to other expenditure categories. The two goods considered here are likely to be extreme cases—the difference between MPCs appears to be present for a private good for a child (child clothing) and absent for an adult good (adult clothing). Categories like recreation and food might be somewhere in between. Second, similar effects might also exist for other income components, such as vacation allowance.[6] Third, it would be interesting to know how sensitive the effect is with respect to a shift between parents in control over income sources, to the degree of "label advertising," and to the frequency of payment.

REFERENCES

Bradshaw, Jonathan; Ditch, J.; Holmes, H. and Whiteford, P. *Support for children: A comparison of arrangements in fifteen countries.* London: HMSO, 1993.

Browning, Martin; Bourguignon, François; Chiappori, Pierre-André and Lechene, Valérie. "Incomes and Outcomes: A Structural Model of Intrahousehold Allocation." *Journal of Political Economy*, December 1994, *102*(6), pp. 1067–96.

Browning, Martin and Meghir, Costas. "The Effects of Male and Female Labor Supply on Commodity Demands." *Econometrica*, July 1991, *59*(4), pp. 925–51.

Del Boca, Daniela and Flinn, Christopher J. "Expenditure Decisions of Divorced Mothers and Income Composition." *Journal of Human Resources*, Summer 1994, *29*(3), pp. 742–61.

Hausman, Jerry A. "Specification Tests in Econometrics." *Econometrica*, November 1978, *46*(6), pp. 1251–71.

Holly, Alberto and Sargan, Dennis. "Testing for Exogeneity in a Limited Information Framework." *Cahiers de Recherches Economiques*, No. 8204, University of Lausanne, 1982.

Levi, Maurice D. "Errors in the Variables Bias in the Presence of Correctly Measured Variables." *Econometrica*, September 1973, *41*(5), pp. 985–86.

[6] Most of the employees in the Dutch private and public sector receive a vacation allowance, which is paid once a year and amounts to approximately 8 percent of annual income.

Lundberg, Shelly J. and Pollak, Robert A. "Separate Spheres Bargaining and the Marriage Market." *Journal of Political Economy*, December 1993, *101*(6), pp. 998–1010.

Lundberg, Shelly J.; Pollak, Robert A. and Wales, Terence J. "Do Husbands and Wives Pool Their Resources?" *Journal of Human Resources*, Summer 1997, *32*(3), pp. 463–80.

Nieuwenhuysen, Th. *The Child Benefit Act* (in Dutch). Zwolle: Tjeenk Willink, 1990.

Statistics Netherlands. *Consumer Expenditure Surveys* (in Dutch). Voorburg/Heerlen: Centraal Bureau voor de Statistiek, 1978–1994.

van Praag, Bernard M. S.; Hagenaars, Aldi J. M. and Eck, Wim van. "The Influence of Classification and Observation Errors on the Measurement of Income Inequality." *Econometrica*, July 1983, *51*(4), pp. 1093–108.